

REMARKS

Claims 1-11 are pending in this application. Claims 8 and 11 have been amended herein.

The amendments to claims 8 and 11 are for clarity. Claim 8 has been amended to correct a spelling error and claim 11 has been amended to correct a minor grammatical error.

Claims 1, 2 and 4-6 are rejected under 35 U.S.C. 102(b) as anticipated by Nitta (U.S. Pat. No. 5,798,537) (Office action point 3).

The rejection of claims 1, 2, and 4-6 is respectfully traversed.

In the rejection, the Examiner has taken Nitta's buffer layer 101 as the recited buffer layer having a super lattice structure. Nitta's buffer layer 101 is n-type $\text{In}_x\text{Al}_y\text{Ga}_{1-x-y}\text{N}$, and is covered by cladding layer 102.

However, Applicants note that Nitta does not disclose a super lattice structure. Nitta's buffer layer 101, made of an n-type GaN-based semiconductor, is not a super lattice layer. The Nitta reference does not contain the term "super lattice".

Applicants further note that Nitta provides no suggestion or motivation for making the cladding layer a super lattice. The purpose in Nitta of the buffer layer 101 is to relax lattice mismatching between the first cladding layer 102 and the sapphire substrate 100. On the other hand, one object of the present invention to provide a high-speed semiconductor device that suppresses Gunn oscillation and can provide high power output by having the super lattice structure. Nitta's first cladding layer is also not a super lattice layer. The cladding layer is formed in order to induce

electrical current to the active layer and prevent light from leaking. No suggestion for a super lattice in Nitta can be inferred from these purposes.

Since there is no suggestion or motivation in Nitta for a super lattice structure, no *prima facie* case of obviousness can be made using Nitta, and claims 1, 2 and 4-6 are novel and non-obvious over this reference.

Claims 3, 10 and 11 are rejected under 35 U.S.C. 103(a) as unpatentable over Nitta (U.S. Pat. No. 5,798,537) (Office action point 4).

The rejection of claims 3, 10 and 11 is respectfully traversed.

As noted with regard to the rejection in point 3 of the Office action, Nitta does not teach, suggest or motivate the super lattice structure recited in claim 1, from which claims 3, 10 and 11 depend.

Moreover, with regard to claim 10, the Examiner states that Nitta does not disclose the sapphire film (compound semiconductor substrate) having a resistivity more than 1.0×10^8 in total, but that "it would have been obvious ... to form the compound semiconductor substrate has a resistivity more than 1.0×10^8 in total, in order to provide a blue light emitting device capable of adjusting wavelength freely without reducing intensity of the light to be generated, because such structure is conventional in the art for forming blue light emitting device"

Applicants further assert there is no suggestion or motivation for the Examiner's proposed modification of Nitta. Nitta clearly states that the resistivity of the sapphire film is less than $1 \Omega\text{-cm}$. This cannot possibly suggest a resistivity of greater than $1.0 \times 10^8 \text{ Ohm-cm}$ in total as recited in

claims 10 and 11.

Applicants therefore assert that claims 3, 10 and 11 are novel and non-obvious over Nitta.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as unpatentable over Nitta (U.S. Pat. No. 5,798,537) in view of Applicant's prior art.

The rejection of claims 7 and 8 is respectfully traversed.

As noted above, Nitta does not disclose a buffer layer having a super lattice structure, as required by the claims. The prior art of Fig. 1, referred to by the Examiner, also does not provide this buffer layer having a super lattice structure.

Moreover, with regard to claim 8, the Examiner has stated that the admitted prior art does not disclose the 2-Dimensional Electron Gasses. The Examiner states that "such structure is conventional in the art for forming a blue light emitting device." However, the Examiner has provided no reference nor affidavit under 37 C.F.R. 1.104(d)(2) regarding his personal knowledge on this point.

Applicants assert that the 2-dimensional Electron Gasses are **not** conventional in the optical devices. In the present invention, the 2-dimensional Electron Gasses are used for separating an electron-supplying layer from an electron transit layer to improve the electron mobility of HEMT.

Applicants therefore assert that claims 7 and 8 are novel and non-obvious over Nitta and the admitted prior art.

Claim 9 is objected to (Office action point 5).

Amendment under 37 CFR 1.111
Fumikazu YAMAKI et al.

U.S. Patent Application Serial No. 10/035,444
Attorney Docket No. 011796

Given Applicants' above traversal of the rejection of claim 1, Applicants have not rewritten claim 9 in independent form.


If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

Attached hereto is a marked-up version of the changes made by the current amendment. The attached page is captioned "**Version with markings to show changes made.**"

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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PATENT TRADEMARK OFFICE

Enclosures: Version with markings to show changes made

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please amend claims 8 and 11 as follows:

8. (Amended) A semiconductor device as claimed in claim 7, wherein the active layer has
~~2-Dimensional~~ 2-Dimensional Electron Gasses.

11. (Amended) A semiconductor device as claimed in claim 1, wherein the compound
semiconductor substrate ~~comprising~~ comprises a compound semiconductor support substrate having
a resistivity more than 1.0×10^8 Ohm-cm and a compound semiconductor having a resistivity less
than 1.0×10^8 Ohm-cm.